

What is claimed is:

1. A laser driving apparatus including: a laser; a laser driving circuit for supplying a drive current to said laser; and radio frequency current superimposing means for generating a radio frequency current and superimposing said radio frequency current on said drive current; comprising:

current monitoring means for monitoring said drive current;

optical detection means for detecting an optical output of said laser;

amplitude control means for controlling an amplitude of said radio frequency current to be superimposed on said drive current;

optical output control means for controlling said laser driving circuit to make said optical output of said laser at a constant level; and

control means for controlling said amplitude of said radio frequency current on the basis of current values of said drive current obtained by said current monitoring means at a plurality of said amplitudes of said radio frequency current obtained by said amplitude control means or detection values of said optical output of said laser obtained by said optical detection means at a plurality of said amplitudes of said radio frequency current obtained by said amplitude control means.

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2. The laser driving apparatus as claimed in claim 1, wherein:

a plurality of said amplitudes of said radio frequency current are defined as two values including zero and non-zero.

25 3. The laser driving apparatus as claimed in claim 1, wherein:

said amplitude control means controls whether said radio frequency current is superimposed on said driving current or not, and

said control means obtains a difference between said driving current monitored when said radio frequency current is superimposed on said driving current and said driving current monitored when said radio frequency current is not superimposed on said driving current, and controls

said amplitude of said radio frequency current on the basis of said difference as said current values of said drive current under condition that said optical output of said laser is controlled at said constant level.

5 4. The laser driving apparatus as claimed in claim 3, wherein:

 said control means controls said amplitude of said radio frequency current so as to make said difference between said driving current monitored when said radio frequency current is superimposed on said driving current and said driving current monitored when said radio frequency current is not superimposed on said driving current constant.

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5. The laser driving apparatus as claimed in claim 1, wherein:

 said amplitude control means controls whether said radio frequency current is superimposed on said driving current or not, and

15 said control means obtains a difference between said optical output detected when said radio frequency current is superimposed on said driving current and said optical output detected when said radio frequency current is not superimposed on said driving current, and controls said amplitude of said radio frequency current on the basis of said difference under condition

20 that said driving current is controlled at said constant level.

6. The laser driving apparatus as claimed in claim 5, wherein:

 said control means controls said amplitude of said radio frequency current so as to make said difference between said optical output detected when said radio frequency current is superimposed on said driving current

25 and said optical output detected when said radio frequency current is not superimposed on said driving current constant.

7. The laser driving apparatus as claimed in claim 1, further comprising:

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 temperature monitoring means for monitoring a temperature

related to said laser, wherein:

said control means controls said amplitude of radio frequency current when a change in said temperature satisfies a predetermined condition.

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8. An optical head apparatus including: an optical system; a laser for emitting laser light through said optical system; a laser driving circuit for supplying a drive current to said laser; and radio frequency current superimposing means for generating a radio frequency current and
10 superimposing said radio frequency current on said drive current for reading information signal from a recording medium, comprising:

current monitoring means for monitoring said drive current;

optical detection means for detecting an optical output of said laser;

amplitude control means for controlling an amplitude of said radio
15 frequency current to be superimposed on said drive current;

optical output control means for controlling said laser driving circuit to control said optical output of said laser at a constant level; and

control means for controlling said amplitude of said radio frequency current on the basis of current values of said drive current obtained by said
20 current monitoring means at a plurality of said amplitudes of said radio frequency current obtained by said amplitude control means or detection values of said optical output of said laser obtained by said optical detection means at a plurality of said amplitudes of said radio frequency current obtained by said amplitude control means.

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9. The laser driving apparatus as claimed in claim 8, wherein:

a plurality of said amplitudes of said radio frequency current are defined as two values including zero and non-zero.

30 10. The laser driving apparatus as claimed in claim 8, wherein:

said amplitude control means controls whether said radio frequency

current is superimposed on said driving current or not, and

said control means obtains a difference between said driving current monitored when said radio frequency current is superimposed on said driving current and said driving current monitored when said radio frequency current is not superimposed on said driving current, and controls said amplitude of said radio frequency current on the basis of said difference under condition that said optical output of said laser is controlled at said constant level.

10 11. The laser driving apparatus as claimed in claim 10, wherein:

said control means controls said amplitude of said radio frequency current so as to make said difference between said driving current monitored when said radio frequency current is superimposed on said driving current and said driving current monitored when said radio frequency current is not superimposed on said driving current constant.

12. The laser driving apparatus as claimed in claim 8, wherein:

said amplitude control means whether said radio frequency current is superimposed on said driving current or not, and

20 said control means obtains a difference between said optical output detected when said radio frequency current is superimposed on said driving current and said optical output detected when said radio frequency current is not superimposed on said driving current, and controls said amplitude of said radio frequency current on the basis of said difference under condition
25 that said optical output of said laser is controlled at said constant level.

13. The laser driving apparatus as claimed in claim 12, wherein:

said control means controls said amplitude of said radio frequency current so as to make said difference between said optical output detected when said radio frequency current is superimposed on said driving current and said optical output detected when said radio frequency current is not

superimposed on said driving current constant.

14. The laser driving apparatus as claimed in claim 8, further comprising:

5 temperature monitoring means for monitoring a temperature related to said laser, wherein:

said control means controls said amplitude of radio frequency current when a change in said temperature satisfies a predetermined condition.

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15. The laser driving apparatus as claimed in claim 8, wherein:

said amplitude of said radio frequency current is controlled under control that said optical output control means controls said laser driving circuit to make said optical output of said laser at said constant level which
15 is not greater than a reproduction power necessary for reading said information signal.

16. An information processing apparatus including a laser; a laser driving circuit for supplying a drive current to said laser; a radio frequency
20 current superimposing means for generating a radio frequency current and superimposing said radio frequency current on said drive current; a lens system for reading and recording information signal for a recording medium; and servo control means for controlling said lens system; comprising:

25 current monitoring means for monitoring said drive current;
optical detection means for detecting an optical output of said laser;
amplitude control means for controlling an amplitude of said radio frequency current to be superimposed on said drive current;
optical output control means for controlling said laser driving circuit
30 to make said optical output of said laser at a constant level; and
control means for controlling said amplitude of said radio frequency

current on the basis of current values of said drive current obtained by said current monitoring means at a plurality of said amplitudes of said radio frequency current obtained by said amplitude control means or detection values of said optical output of said laser obtained by said optical detection means at a plurality of said amplitudes of said radio frequency current obtained by said amplitude control means.

17. The laser driving apparatus as claimed in claim 16, wherein:
a plurality of said amplitudes of said radio frequency current are defined as two values including zero and non-zero.

18. The laser driving apparatus as claimed in claim 16, wherein:
said amplitude control means controls whether said radio frequency current is superimposed on said driving current or not, and

said control means obtains a difference between said driving current monitored when said radio frequency current is superimposed on said driving current and said driving current monitored when said radio frequency current is not superimposed on said driving current, and controls said amplitude of said radio frequency current on the basis of said difference under condition that said optical output of said laser is controlled at said constant level.

19. The laser driving apparatus as claimed in claim 18, wherein:
said control means controls said amplitude of said radio frequency current so as to make said difference between said driving current monitored when said radio frequency current is superimposed on said driving current and said driving current monitored when said radio frequency current is not superimposed on said driving current constant.

20. The laser driving apparatus as claimed in claim 16, wherein:
said amplitude control means controls whether said radio frequency

current is superimposed on said driving current or not, and

said control means obtains a difference between said optical output detected when said radio frequency current is superimposed on said driving current and said optical output detected when said radio frequency current is not superimposed on said driving current, and controls said amplitude of said radio frequency current on the basis of said difference under condition that said drive current of said laser is controlled at a constant level.

21. The laser driving apparatus as claimed in claim 20, wherein:
said control means controls said amplitude of said radio frequency current so as to make said difference between said optical output detected when said radio frequency current is superimposed on said driving current and said optical output detected when said radio frequency current is not superimposed on said driving current constant.

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22. The laser driving apparatus as claimed in claim 16, further comprising:

temperature monitoring means for monitoring a temperature related to said laser, wherein:

20 said control means controls said amplitude of radio frequency current when a change in said temperature satisfies a predetermined condition.

23. The laser driving apparatus as claimed in claim 16, wherein:

25 said amplitude of said radio frequency current is controlled, while said optical output control means controls said laser driving circuit to make said optical output of said laser at said constant level which is not greater than a reproduction power necessary for reading said information signal.

30 24. The laser driving apparatus as claimed in claim 16, wherein:
said amplitude control means and said control means control said

amplitude of said radio frequency current when said reading and recording
said information signal is not executed.